observed this bee-eater and Dauri (Hoshangabad Dist.) below Pachmarhi on 21-1-1942. Its occurrence in this area now seems well established—Eds.]

X.—A RECORD OF HODGSON'S FROGMOUTH (*BATRACHOSTOMUS JAVENSIS HODGSONI*) AND THE COCHIN-CHINA SPINETAIL *HIRUNDAPUS CAUDACUTUS* SSP. FROM NORTHERN BURMA.

While on active service recently in Burma I picked up (literally, for both were picked up dead) two interesting specimens which I skinned and carried in my pack for many days.

The specimen of Hodgson's Frogmouth was picked up on May 8, 1944 in the Katha district near the Kachin village of Lamai (Lat. 24° 53′, Long. 96° 03′) which is about 20 miles north-west of Mohnyin on the Burma railway. It was found at 2,000 feet on the path in bamboo jungle, with evergreen forest just below. The Kachins said it was called *Oo-koo* in Jinghpaw and *Kinbok* in Burmese, was fairly common, and its call was *po-chyi, po-chyi, po-chyi*, . . . , uttered rapidly; this information may not be reliable, and is given for what it is worth. The bird was in moult, and proved very difficult to skin. Previous records of Frogmouths from Burma are (writing from memory) from Mt. Victoria, Karenni, and the Dawnas, but not all of these three are Hodgson's species.

The Cochin-China Spinetail was floating down the Nampang stream (Lat. 25° 24′ Long. 96° 08′) in the Myitkyina district, about 6 miles south of Haungpa on the Uyu river; elevation 700 feet, date May 14, 1944. In measurement (wing c. 190 mm.) the specimen is intermediate between the measurements given in the *F.B.I.*, 2nd edition, for the race *nudipes* and the race *cochinchinensis*, and may prove to be an interesting connecting link. Again from memory, the only previous records of this species from Burma are those of J. K. Stanford from the east of the Myitkyina district.

SHILLONG. B. E. SMYTHIES,
May 29, 1944. *Burma Forest Service.*

[In his "Birds of Burma" Smythies records Hodgson's Frogmouth from Mt. Victoria and in Karenni. The former is ca. 21°N. × 94°E., the latter between 18-20°N. × 96-98°E.—Eds.]

XI.—NOTE ON THE NESTING OF THE HIMALAYAN SWIFTLET (*COLLOCALIA FUCIPHAGA*).

Rumours of pot holes over 1,000 feet deep took me to Buina Dhar above the ruined Buinathach Forest Rest-House in Chakrata District, U.P. Here just below the top of a knife-edge ridge was a fine open pot 110 feet deep and about 15 feet in diameter and close by on the other side of the ridge a small opening blocked by stones leading into a separate chamber with its floor 80 feet below the opening.

The open pot expands downwards and at the lower portion is about 60 feet long and 30 feet broad. From the bottom of the shaft a slope of fallen boulders leads down N.N.W. along the long axis of the pot. At the far end there is a small extension blocked a few feet in by a rockfall cemented with calcite. Very little light penetrates from the shaft opening and about fifty feet above the floor there is a gallery about four feet wide and here there is a small triangular window about two feet wide and five feet high leading into a second chamber. This second chamber continues in the N.N.W. direction and is about 40 feet long, 12 feet wide and about 40 feet high. The floor slopes downwards from the window, and from the far end one can turn back down a steep slope and descend through an awkward squeeze into a small lower chamber where there are some fine coloured calcite formations. Elsewhere there is very little calcite formation.

As the open pot is on the cool shady side of the hill a strong current of air passes down the shaft thence through the opening into the second chamber and up through the small opening on the sunny south-west side of the ridge.

Himalayan Swiftlets (*Collocalia fuciphaga*) fly down the open pot then through the window into the other chamber and nest there in great numbers. Only the faintest glimmer of light enters this chamber through this window and through the blocked opening above, so that the birds are practically in complete darkness. The window opening into the inner chamber must look like a black void through which they fly. Hence, when I had lighted candles in the inner chamber, and sat in the window, they seemed to mistake my silhouette for the opening and frequently hit me. So far at least they appear to depend on sight to find their way.

At the end of May the birds are in residence with nesting activities in all stages from no eggs,—one new-laid egg, two eggs under incubation,—to two half-fledged chicks. Only two eggs are laid and these are white, and ellipsoidal with only a slight narrowing at one end. The dimensions of the egg measured were length 20 mm., breadth 13.8 mm.

The nest is made of moss gummed in layers by means of the viscid saliva which is also used to stick the nest to the vertical rock wall, no use being made of rock ledges to support the nests.

The nest has an open cup about $2\frac{1}{2}$ inches diameter and $\frac{3}{4}$ inch deep, below the cup is a slightly tapering pedestal about 2 inches thick. This pedestal perhaps represents growth of the nest, as a result of the cup at the top receiving a new layer each year. The rim of the cup is not horizontal but slopes down from the wall at about 30° or more from the horizontal. The side of the nest adhering to the wall projects upwards giving an increased bearing surface. The nest is not lined and no feathers are used.

Beyond a slight excitement and twittering when we first entered, the birds took little notice of us and continued their nesting activities undisturbed. In the middle of the day they came in large numbers and rested in clusters on the walls clinging in a vertical position, head upwards on to minute roughness of the wall. Later when climbing the ladder out of the cave one could pick an adult bird off a nest and put it back again without causing undue alarm.

When the cave was visited in the last week of October, no birds were present.

Nearly the whole floor of the inner chamber is covered with the regurgitated dejecta of undigested insect remains. This is a perfectly clean dark-brown material, devoid of smell; it cakes slightly when damp, but breaks up readily into a fine sand. The thickness of the layer of dejecta is about 2 feet, so there must be not less than 200 cubic feet of this material showing that the colony has occupied this cave for a very long period. The top layers of the dejecta are coarse, but it gets gradually finer as one gets lower. This fact and also the compaction with depth should be taken into account in any calculation of the time necessary for this accumulation. Below this there is an abrupt change to ordinary cave earth.

By the end of May there is a thin white crust of guano over this deposit, and there must be further accumulation during the summer, but by the end of October all of this has vanished. In May the inner chamber is very dry, and it is no doubt on account of this that it is chosen as a nesting place; in October the dampness is not markedly greater, but the fact that the guano vanishes, and that the predatory larvae of large beetles evidently find means of living in the cave suggest that during the rains the humidity is considerable. Insects are not common either in late May or late October, and I have not visited the cave during the rains. It would be interesting to do so. It is a speleological commonplace that caves when dry will often be found apparently entirely devoid of life, but the same cave under wetter conditions will be found with a teeming population, and I would expect this to be the case in this cave. During the dry period the fauna has hidden itself away in inaccessible crevices.

A cave of this nature is certain to have an entirely different type of fauna to that in caves without an organic deposit; it is therefore not surprising that none of the insects, or myriapods found here are to be found in the extensive caves further to the west in the Chakrata forest division, where there are no Swifts. Only the spiders may be the same.

In Swiftlet Pot the following has been found:—

Coleoptera: A carabid beetle (*Sphodropsis cnesipus* (Andr.)).
A staphyline beetle.
Another beetle was seen, probably *Cryptophagus* sp. but it escaped into a crevice.

Microlepidoptera: A small buff-winged moth, not flying to light, common.

Collembola: One species, very few seen.

Myriopoda: One species, several found, always deep down at the junction between the dejecta layer and the cave earth.

Arachnida: One species.

Old adults of the carabid beetle were found in May on the surface of the deposit, but in October a very recently emerged specimen was found about six inches down in the layer of dejecta. I think there is no doubt that the immature stages of this beetle were spent in the cave.

On my first visit I was unaccompanied, and on this occasion only descended the 110-foot pot, and failed to observe the window into the inner chamber since this was hidden from below by the ledge. In October 1942, with R. D. Leakey the inner chamber was entered, and again in May 1943 when I was accompanied by E. J. Douglas. Both are members of the British Speleological Association and experienced Yorkshire pot-holers. On this latter occasion a goat-herd guided us to two open holes in the wooded hill slopes about half a mile away. A stone thrown down seemed to take between 4 and 5 seconds before hitting the bottom with a dull thud. All my rope ladders were tied together making a total of 152 feet, the last 30 feet being very old and flimsy. Down this Douglas climbed and at the very foot of the ladder found himself hanging in space far out of sight of the bottom, which must have been at least 100 feet further down, and so up again—hard work at nearly 9,000 feet above sea level.

All this time swiftlets were diving down straight out of the sunlight into the black shaft and going down in steep spirals in pitch darkness to their nests 300 feet or so below ground. Nests started 50 feet down, but the majority were far below the bottom of the ladder. These two open pots are about 50 yards apart and are almost certainly connected below perhaps by some great cavern.

Here then is an interesting piece of exploration yet to be done, but not one to be undertaken without careful planning and with a strong party.

The situation of these caves is as follows:—

Chakrata District, U.P.

Chakrata Forest Division.

Bawar Range, Kudog Reserved Forest.

Swiftlet Pot. Lat. 30° 45′ 20″; long. 78° 00′ 35″; height 8,525 feet on Biuna Dhar. It is about 20 yards north of the path where it crosses the ridge.

Swift Holes. Lat. 30° 45′ 11″; long. 78° 00′ 18″; height 8,550 feet. They are little below on the north side of the ridge about 200 yards north-west of point 8837 amongst trees.

The following Survey of India maps should be consulted:—

½ inch to 1 mile map 53 J/NW; Forest map 4 inches to 1 mile 53 J/1 S.2.

Water is scarce and is only to be obtained from below the Buinathach F.R.H. or on the way to Kudog F.R.H.

Accompanied by H. J. Larwood, I revisited the Biunathach area in May 1944. The year was a late one and there were still a few drifts of snow at 9,000 feet on the Mandali road beyond Deoban on 7th May. Descending Swiftlet Pot on 9th May, we found all the nests with two eggs apiece, but the birds were not yet sitting and there were no chicks. The temperature in the upper chamber was 48° F. One bird was secured and sent to the Society enabling the previous identification to be confirmed. No ecto-parasites were found on it.

At the place where I had delved two feet into the insect dejecta and had disturbed the cave earth below, some bacterial activity had been released. A buried stone was found covered

with white slime, and the dejecta from a few inches below the surface had been transformed into a smooth black viscous mess apparently extending to the bottom. Elsewhere the dejecta was unchanged and as previously described. This bacterial action is a new phase, and if it extends over the whole mass of dejecta, conditions in the cave will be profoundly altered.

On 10th May, with Larwood at the top supervising the life-line, I descended the lower of the two Swift Holes, which had been abandoned the previous year owing to shortage of tackle. The bottom was reached at the end of a 243 feet pitch, the rope-ladder hanging clear of the rock all the way down. At the bottom is a hall 18 feet wide and 50 feet long, 30 feet high at the lowest part.

The entry shaft is situated close to the lowest end of the hall and here, looking upwards, daylight can be dimly seen. The hall slopes upwards rising about ten feet to the further end; here an aven evidently leads to the Upper Swift Hole, but it is now blocked. At some time there has been a great fall of clean angular limestone chips usually less than six inches long. This seems to point to very insecure conditions in the upper cave. The fall of stone has blocked what may be a passage extension leading out of the hall at the aven end. At this end too but on the opposite side, a narrow fissure goes on, too small to penetrate. Down this also some small limestone chips had flowed. Looking along this fissure, as far as one could see the lefthand wall was coated with a polished calcite layer coloured, to a height of five feet or so, a livid blood red, perfectly uniform in hue and very startling in appearance. I have never seen anything to equal this.

Conditions in the hall were damper than in Swiftlet Pot. There were several large mounds of insect dejecta with the normal sandy consistency. The temperature in the hall was 48½° F. Nests started fifty feet down the shaft and continued to the bottom and in the hall itself, always located at the dryest and most sheltered parts. Only one or two nests had two eggs, all the rest had one egg only on this date. Both in this cave and in Swiftlet Pot the nests are always separate, usually a foot or more apart and never in clusters.

Attempts to raise the rope ladders failed. They had jammed somewhere. Probably the surplus fifty feet at the bottom got into a tangle. Finally the ropes were cut and the ladders dropped down.

CECIL HOTEL, DELHI. E. A. GLENNIE.
November 5, 1943. *Col.*

XII. THE MYSTERY OF BIRD-'ANTING' (REPRODUCED FROM *COUNTRY LIFE*—NOVEMBER 5, 1943).

One of the minor ornithological mysteries is why birds use ants as part of their toilet. Whatever the explanation may be, the habit has been attested too often by various observers in several countries for there to be any doubt about its occurrence.

Charles K. Nichols, writing in the American bird journal *Auk*, says he saw on his lawn an American robin, which is similar to